

We claim:

1 1. A machine readable medium that provides instructions, which when executed by a
2 set of processors, cause said set of processors to perform operations comprising:
3 receiving an Ethernet frame; and
4 transmitting the Ethernet frame over a non-homogenous tunnel, the tunnel
5 distinguishing subscriber traffic.

1 2. The machine readable medium of claim 1 further comprising transmitting
2 requested values over the non-homogenous tunnel.

1 3. The machine readable medium of claim 1 wherein the Ethernet frame is
2 transmitted on one of the plurality of sessions.

1 4. A machine readable medium that provides instructions, which when executed by a
2 set of processors, cause said set of processors to perform operations comprising:
3 transmitting a set of Ethernet data included in an Ethernet frame with Layer 2
4 Tunneling Protocol (L2TP); and
5 transmitting the set of Ethernet data to a service provider.

1 5. The machine readable medium of claim 4 further comprising the service provider
2 analyzing the set of Ethernet data.

1 6. The machine readable medium of claim 4 wherein the set of Ethernet data is
2 transmitted over a non-homogenous L2TP tunnel.

1 7. The machine readable medium of claim 4 wherein the transmitting the set of
2 Ethernet data comprises encapsulating the Ethernet frame with L2TP.

1 8. The machine readable medium of claim 7 wherein the encapsulating the Ethernet
2 frame comprises:

3 establishing an L2TP tunnel capable of carrying the Ethernet frame;
4 establishing an L2TP session for carrying the Ethernet frame; and
5 prepending L2TP headers onto the Ethernet frame.

1 9. A machine readable medium that provides instructions, which when executed by a
2 set of processors, cause said set of processors to perform operations comprising:

3 encapsulating an Ethernet frame in Layer 2 Tunneling Protocol (L2TP); and
4 transmitting the L2TP encapsulated Ethernet frame over a network; and
5 decapsulating the Ethernet frame from L2TP.

1 10. The machine readable medium of claim 9 wherein the L2TP encapsulated
2 Ethernet frame is transmitted on one of a plurality of sessions of a non-homogenous
3 tunnel.

1 11. The machine readable medium of claim 9 wherein transmitting the Ethernet frame
2 further comprises transmitting attribute value pairs (AVPs) in relation to the Ethernet
3 frame.

1 12. The machine readable medium of claim 9 wherein transmitting the frame
2 comprises:

3 establishing an Ethernet capable L2TP tunnel; and
4 establishing an L2TP session to carry the frame; and
5 transmitting a MAC address.

transmitting a first tunnel control message for Layer 2 Tunneling Protocol (L2TP)
tunnel setup having
an attribute value pair (AVP) indicating Ethernet frame capability,
receiving a second tunnel control message for L2TP tunnel setup having
an AVP indicating Ethernet frame capability;
transmitting a session control message having an AVP indicating an L2TP
Ethernet session and an AVP indicating an Ethernet Media Access Control
(MAC) address; and
transmitting an Ethernet frame with the L2TP Ethernet session.

20. The machine readable medium of claim 19 further comprising performing session
fail retry before transmitting the Ethernet frame.

21. The machine readable medium of claim 19 wherein transmitting the first and
second tunnel control messages comprises manipulating the bits of the first and second
tunnel control messages.

22. A machine readable medium that provides instructions, which when executed by a
set of processors, cause said set of processors to perform operations comprising:
establishing an Ethernet capable Layer 2 Tunneling Protocol (L2TP) tunnel;
accepting an L2TP session;
receiving an L2TP encapsulated Ethernet frame over the session;
decapsulating the Ethernet frame; and
associating the Ethernet frame to a virtual circuit structure.

23. The machine readable medium of claim 22 wherein the tunnel is non-
homogenous.

1 45. A computer implemented method comprising:
 2 receiving an Ethernet frame; and
 3 transmitting the Ethernet frame over a non-homogenous tunnel, the tunnel having
 4 a plurality of sessions.

1 46. The method of claim 45 further comprising transmitting requested values over the
 2 non-homogenous tunnel.

1 47. The method of claim 45 wherein the Ethernet frame is transmitted on one of the
 2 plurality of sessions.

1 48. A computer implemented method comprising:
 2 transmitting a first tunnel control message for Layer 2 Tunneling Protocol (L2TP)
 3 tunnel setup having
 4 an attribute value pair (AVP) indicating Ethernet frame capability,
 5 receiving a second tunnel control message for L2TP tunnel setup having
 6 an AVP indicating Ethernet frame capability;
 7 transmitting a session control message having an AVP indicating an L2TP
 8 Ethernet session and an Ethernet Media Access Control (MAC) address;
 9 and
 10 transmitting an Ethernet frame with the L2TP Ethernet session.

1 49. The method of claim 48 further comprising performing AAA retry before
 2 transmitting the Ethernet frame.

- 1 50. The method of claim 48 wherein transmitting the first and second tunnel control
- 2 messages comprises manipulating the bits of the first and second tunnel control
- 3 messages.